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Cindy Bladey
Office of Administration
Mail Stop OWFN–12–H08
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001

Subject: Industry Comments on, "NRC Draft Regulatory Issue Summary YYYY-####: Disposition of Information Related To The Time Period That Safety-Related Structures, Systems or Components Are Installed," FRN 2016-11598, NRC Docket ID 2016-0098, dated May 10, 2016

Project Number: 689

Dear Ms. Bladey:

On behalf of the nuclear energy industry, the Nuclear Energy Institute (NEI)[1] is pleased to provide the attached comments on the draft Regulatory Issue Summary (RIS) YYYY-####, "Disposition of Information Related To The Time Period That Safety-Related Structures, Systems or Components Are Installed." NEI appreciates the NRC's clarification of the information in the draft RIS following the January 20, 2016, public meeting. NEI provided the NRC with the industry perspectives[2] on issues addressed in the draft RIS on October 20, 2015.

Though many of NEI's previous comments have been addressed by the NRC, NEI remains concerned that NRC positions in the draft RIS prioritize vendor information over the many other inputs that are taken into consideration (i.e., internal and external operating experience, plant specific application and environment, surveillance and inspection results, trend analyses, Electric Power Research Institute (EPRI) preventive maintenance database information, etc.) by licensees in their preventive maintenance program. It still appears from the discussion of 10 CFR 50.2 design basis information that the NRC considers vendor

[1] The Nuclear Energy Institute (NEI) is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel cycle facilities, nuclear materials licensees, and other organizations and entities involved in the nuclear energy industry.

[2] NEI letter from Bruce Montgomery to Scott Morris, NRC, dated October 20, 2015, "Industry Position on the Role of Vendor Recommendations for Service Life of Safety-Related Components"

replacement or refurbishment information as such when in actuality very little if any of this vendor information is design basis or supporting design basis information. The draft RIS needs to maintain the clear distinction between the design process which derives the functional requirements for structures, systems and components (SSC), and the operational phase including maintenance, which ensures that these functional requirements are met by establishing maintenance schedules in accordance with quality assurance programs.

Licensee's quality assurance programs provide for the development of preventive maintenance programs based on several inputs and existing regulatory positions (e.g., Generic Letter 82-09, Environmental Qualification of Safety-Related Electrical Equipment, and Section 3.11 of NUREG-0800, Standard Review Plan). These inputs and regulatory positions address how vendor recommendations and other inputs are considered, including the use of engineering judgment, to determine appropriate replacement or refurbishment frequencies. NEI believes that the existing regulatory framework adequately addresses how various sources of information are to be considered in the development of preventive maintenance programs. Therefore, the draft RIS needs to affirm the existing guidance which will ensure a correct interpretation of the role of vendor recommendations.

NEI is also concerned that the draft RIS is establishing new guidance for entry conditions into the operability/functionality determination process which would create a conflict with existing operability guidance and is not consistent with the intended scope of a RIS. Comment 2 in Attachment 1 provides additional information in this regard and the scenarios in Attachment 2 have been modified to reflect how the operability/functionality determination process would be applied to the hypothetical scenarios in accordance with existing guidance. While the scenarios have proved useful in the development of the RIS as they have aided in a more thorough understanding of the issues, NEI does not believe they should be issued as part of the RIS.

If you have any questions in this matter, please contact me.

Sincerely,

Scott A. Bauer

Attachments

c: Mr. William M. Dean, NRR, NRC
Ms. Michele Evans, NRR, NRC
Mr. Allen G. Howe, NRR/DIRS, NRC
Mr. Chris Regan, NRR/DIRS/IRIB, NRC
Mr. Harold Chernoff, NRR/DIRS/IOEB, NRC

Specific Comments on Draft Regulatory Issue Summary YYYY-####, "Disposition of Information Related To the Time Period That Safety-Related Structures, Systems or Components Are Installed"

NEI provides the following specific comments to supplement those provided in the cover letter.

1. NEI agrees with the concept of "credible information" in that the right information needs to be reviewed for its impact on preventive maintenance strategies. However, the definition is too broad and, as such, would be subject to widely varying interpretations. Furthermore, reliance needs to be placed on existing guidance as a RIS is not an appropriate vehicle to define a new term. The industry recommends that applicable sections of the draft RIS be revised to replace "credible information" with NRC generic communications, operating experience, and vendor service advisories that have a valid technical basis and are related to applications in the nuclear power industry. Assessment of newly discovered information should only take place when it is technically-based and has the potential to invalidate the assumptions of an existing maintenance strategy.
2. The RIS, and especially the scenarios, imply that the operability process is immediately entered upon receipt of vendor service advisories, NRC generic communications, and operating experience. The draft RIS should be revised to clearly illustrate the need to screen this information for applicability and impact. When new information is received, it is first screened for applicability to the specific plant design and licensing basis and to determine if it contains technically-based information that has the potential to impact the inputs to an existing maintenance strategy. That review determines whether a condition adverse to quality exists. If so, the issue is entered into the corrective action program. Operability/functionality is assessed as part of this program. Differences between vendor maintenance recommendations and a licensee's documented maintenance strategy need to be understood and reconciled but do not, as a matter of course, result in an SSC being in a degraded or non-conforming condition. The draft RIS should reflect the existing process and should not establish new guidance for this process. The proposed industry changes to the scenarios include how the issues would be screened through the existing processes.

Comments on Hypothetical Examples of Acceptable Disposition of Information Related to the Time Period that Safety-Related Structures, Systems, or Components Are Installed

Scenario 1

Background:

Component:
Boiling-Water Reactor (BWR) Automatic Depressurization System (ADS) Valve Pilot Solenoid actuator

Safety Classification:

Class 1E, safety-related Technical Specifications:
ADS function of seven safety relief valves is required when in Mode 1, and when in Mode 2 or 3 above 150# reactor steam dome pressure.
Surveillance requirements: Verify each ADS valve opens when manually actuated (18-month staggered test basis). Technical Specifications (TS) require procedures in accordance with Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation), Revision 2, 1978, Appendix A."

Other Requirements:

American Society of Mechanical Engineers Operations and Maintenance Code Appendix I

Maintenance Rule Applicability:

In scope of the maintenance rule; current status is 50.65(a)(2).

Preventive Maintenance Program Guidance:
Plant procedures define a maintenance interval of 18 months (during refueling) for performing visual inspection of the solenoid; testing electrical continuity of the circuit; and replacing worn components as needed. Plant procedures specify a replacement interval of 8 years based on the EPRI Preventive Maintenance Basis Database and site operating experience.

ADS pilot valve vendor manual, which is not part of the plant's supporting licensing basis, recommends replacement every 3-8 years, based on application.

Overview:

No failures at the plant, but there have been several failures of ADS pilot solenoid actuators at other BWRs over several years attributed to degradation of epoxy resin potting on the solenoid coils. The average age at failure was 5 years. As a result, the manufacturer recently issued a service information letter (SIL) to all BWR licensees recommending that the replacement interval be changed to 3-5 years. Three of the seven ADS solenoid actuators will be 7 years old by the end of the current operating cycle. The remaining valves have been installed for 1-2 years.

Initial Actions:

- Enter the SIL into either the Vendor Technical Information Program (VTIP) or Operating

Experience (OE) review process for the station.

- Contact the vendor and identify the conditions that lead to the premature degradation of the epoxy in the solenoid coils (temperature, radiation, etc.).
- Review the plant specific conditions over the installed life of the components are more severe or less severe than the conditions reported by the vendor that led to premature degradation
- If a condition adverse to quality is identified, enter the issue into the corrective action program.
- Determine if a Degraded/Nonconforming condition exists for the station.

Degraded/Nonconforming Condition Exists:

Licensee determines that the plant specific conditions are more severe than conditions reported by the vendor in the SIL, and based on testing of previously removed ADS solenoid actuators that were installed for 8 years, there is some degradation of the epoxy resin potting that results in a nonconformance with the vendor product data sheet for epoxy resin potting.

- Document the evaluation that the three valves, installed for 7 years, will remain operable until the planned replacement.
- Replace the affected valves at the next outage of sufficient duration and the valves that had been installed for 1-2 years at the new interval.
- Revise the preventive maintenance frequency to reflect a new replacement interval of 3-5 years.

No Degraded/Nonconforming Condition Exists:

Licensee determines that the plant specific conditions are less severe than conditions reported by the vendor in the SIL and, based on discussion with the vendor and review of operating experience, the licensee determines that the current maintenance frequencies are acceptable.

- Licensee documents the determination that the existing replacement interval (8 years) is acceptable because of different environmental conditions in accordance with the OE review process.
- Licensee updates the preventive maintenance basis to document the difference between the vendor recommended frequency in the SIL and the licensee's replacement frequency.

Scenario 2

Background:

Component:

Fuel oil flexible hoses (rubber) used to deliver fuel to the emergency diesel generators

Safety Classification:

Safety-related

Technical Specifications:

Verify the fuel oil transfer system operates to automatically transfer fuel oil from storage tank[s] to the day tank and engine mounted tank. TS require procedures in accordance with Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation), Revision 2, 1978, Appendix A."

Maintenance Rule Applicability:

In scope of the maintenance rule; current status is 10 CFR 50.65(a)(2)

Preventive Maintenance Program Guidance:

Plant procedures define a maintenance replacement interval of 3 years. This is consistent with the manufacturer's recommendation.

Other Requirements:

10 CFR 54.37(b) [applies to Case 4 only]

Overview:

The following scenario and the associated cases are based on a plant that has received a renewed license and is operating in the period of extended operation (i.e., beyond 40 years). During the review of the license renewal application (LRA), the licensee did not address aging effects associated with exposure of the internal surfaces of the hoses to fuel oil. Based on the results of the staff's review of the licensee's LRA, and the licensee's commitments, the hoses should be replaced based on the manufacturer's recommended interval. Subsequent to entering the period of extended operation, the licensee determines that the hoses have not been replaced based on the manufacturer's recommended interval.

Case 1:

The licensee concludes the planned 3-year replacement interval was established for maintenance efficiencies and there is a technical basis for a longer replacement interval, which has not been exceeded.

Initial Actions:

- Identify deficient implementation of the station's 3-year hose replacement maintenance plan in the Corrective Action Program

Licensee Planned Approach:

- Licensee documents its determination based on the technical basis that the required replacement interval has not been exceeded. Licensee will replace the hoses during maintenance activities and retain the current replacement interval.

Case 2:

Extenuating circumstances prevented the licensee from replacing the hoses within their 3-year replacement interval. The licensee previously documented an evaluation providing technical justification for the deviation from the existing 3-year replacement interval and established a new future replacement date. The licensee will retain the existing 3-year replacement interval.

Initial Actions:

- No immediate actions are required because the licensee previously completed the technical justification prior to exceeding the 3-year replacement interval.

Licensee Planned Approach:

- Licensee has already provided justification for implementing a replacement interval greater than defined by the existing basis documents.

Case 3:

The licensee recently identifies that the installed fuel hoses have been in-service beyond the maximum interval established in the existing technical basis associated with the PM bases, including technical justification previously documented for deviating from the PM interval.

Initial Actions:

- Identify deficient implementation of the station's 3-year hose replacement maintenance plan in the Corrective Action Program.

- The nonconformance is evaluated to determine if a specified safety function is impacted. Since the subject hose is part of the Emergency Diesel Generator system, a nonconforming condition exists and an immediate operability determination of operable is made based on no operating experience from the industry regarding indications of increased failure, successful previous testing results, and actual operating conditions which are mild and well within parameters on the vendor data sheet.

Licensee Planned Approach:

- During performance of the operability determination, the licensee determines and documents that periodic replacement is not required based on the licensee's review of the material and environment.
- Licensee documents the basis to exclude the hoses from periodic replacement and License Renewal scope in its corrective action program or engineering processes.

Case 4:

The licensee recently identifies that the installed fuel hoses have been in-service beyond the maximum interval established in the existing technical basis associated with the PM bases, including technical justification previously documented for deviating from the PM interval.

Initial Actions:

- Identify deficient implementation of the station's 3-year hose replacement maintenance plan in the Corrective Action Program.

- The nonconformance is evaluated to determine if a specified safety function is impacted. Since the subject hose is part of the Emergency Diesel Generator system, a nonconforming condition exists and an immediate operability determination of operable is made based on no operating experience from the industry regarding indications of increased failure, successful previous testing results, and actual operating conditions which are mild and well within parameters on the vendor data sheet.

Licensee Planned Approach:

- During performance of an operability determination, the licensee determines that it will manage potential aging effects by an alternative method such as periodic visual inspections accompanied by physical manipulation of the hoses.

- Licensee documents its determination that it will manage potential aging effects by an alternative method such as periodic visual inspections accompanied by physical manipulation of the hoses.

- This disposition would be documented in the next FSAR update. As required by 10 CFR 54.37(b) the FSAR update must describe how the effects of aging will be managed for these hoses such that the intended function(s) in 10 CFR 54.4(b) will be effectively maintained during the period of extended operation.

Scenario 3

(Replaces direct current electrical power subsystems)

Background:

Component:

Normally energized relay within the reactor protection system that provides a trip signal to the reactor trip breaker.

Safety Classification:

Class 1E, Safety-related

Technical Specifications:

The reactor trip system instrumentation is operable in MODEs 1 and 2.

USAR/Licensing Basis Considerations:

Each reactor trip channel is designed on the "de-energize to operate" principle; a loss of instrument power to that channel causes the system to go into its trip mode. This equipment is selected to withstand the most adverse environmental conditions to which it will be subjected; this also includes post-accident environment.

The subject relays are located in the relay room that is a mild environment.

Other Requirements:

IEEE-344-1987, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations"

IEEE-323-1971, Standard Qualification for Class 1E Equipment for Nuclear Power Generating Stations

Maintenance Rule Applicability:

In scope of the maintenance rule; current status is 10 CFR 50.65(a)(2)

Preventive Maintenance Program Guidance:

PM strategies are created based on the combination of plant operating history, industry operating experience, and EPRI PM Basis Database template for relays. The EPRI PM template for control relays recommends functional testing every 2 years and replacement at 10-years for relays that are continuously energized, in severe service conditions, or cycled frequently. Replacement schedule may be extended based on completed testing and impact of environmental conditions.

Overview:

Vendor datasheet provided with original plant construction purchase order indicates that the relays have life of 20 years in mild power system environments and the contact life is 15,000 operations.

Updated vendor information was received via the vendor technical information program (VTIP) and shows the relays have service life of 10,000 operations and no life in years is provided. The vendor was contacted and clarified that the data sheet is part of marketing information and not necessarily specific to the relays purchased. However, this relay model is generally qualified for 10,000 operations with a life of 20 years.

Initial Actions

- Updated vendor information is processed via the VTIP process which determines if the updated information is applicable to equipment at the station. In this instance, the updated data sheet is associated with the relays installed at the plant. The fact that the datasheet was described as "marketing information" from the vendor is not used as a reason to dismiss the information.

- The VTIP process then drives a determination of the impact of the changes in the technical information (15,000 operations was reduced to 10,000 operations).

Case 1:

The number of cycling experienced by the installed relay contacts is determined to be less than (<) 10,000.

Initial Actions:

- No immediate actions are required because the installed relays have less 10,000 cycles.

Licensee Planned Approach:

- The PM basis is updated and the vendor technical manual is updated with the new information.

Case 2:

The number of cycles experienced by the relay contacts is determined to be greater than (>) 10,000.

Initial Actions:

- The Corrective Action Program is entered to document the nonconformance that the number of cycles experienced by the relay contacts is greater than 10,000.
- The nonconformance is evaluated to determine if a specific safety function is impacted. Since the subject relay is part of the reactor protection system, a nonconforming condition exists and an immediate operability determination of operable is made based on no operating experience from the industry regarding indications of increased failure, successful previous testing results, and actual operating conditions which are mild and well within the test conditions documented on the data sheet.

Licensee Planned Approach:

- A technical determination is documented to establish a replacement interval beyond the manufacturer's recommended interval for the relays.

- The PM basis is updated and the vendor technical manual is updated with the new information.

Scenario 4

Component:

Pressurized Water Reactor Main Steam Isolation Valve (MSIV) Limit Switch

Safety Classification:

Safety-related

Technical Specifications:

Each MSIV and its associated actuator train shall be OPERABLE in Modes 1, 2 and 3.

UFSAR/Licensing Basis Considerations:

The licensee's UFSAR states that safety-related systems and components are designed to withstand the normal and expected extreme environmental conditions for the qualified life of the components. The UFSAR states that equipment does not need to be replaced at the end of its qualified life by artificial aging techniques provided that periodic maintenance, inspection and/or replacement is based on sound engineering practices and recommendations of the equipment supplier, which are updated as required based on the results of surveillance tests, review of equipment and component failures, and reviews of preventive maintenance and test results.

Other Requirements:

None

Maintenance Rule Applicability:

In scope of the maintenance rule, current status is 10 CFR 50.65(a)(2).

Preventive Maintenance Program Guidance:

Plant maintenance procedures require periodic verification that limit switch indication properly matches actual valve position.

Overview:

The MSIV limit switches were designed for 40 years of service in a mild environment. This information is described in the UFSAR. The following cases highlight potential situations that could call into question the reliability of MSIV limit switches based either on actual failures or the availability of operating experience.

Case 1:

Although the limit switches are designed to withstand the plant's radiation environment for 40 years, the switch vendor recently issued a notice stating that additional analysis of the phenolic material in the switches indicates an increased potential for failure after 30 years of service in a mild radiation environment. This determination was based on industry operating experience and laboratory analysis.

Initial Actions:

- Licensee enters the vendor notice into the vendor technical information program (VTIP).
- Licensee contacts the vendor and identifies additional information regarding the conditions that led to the premature degradation of the phenolic material (radiation levels).
- Licensee evaluates the plant specific conditions over the installed life of the components and results of surveillance tests, reviews of equipment and component failures, and reviews of preventive maintenance and test results to validate that the environmental conditions that cause the premature degradation are more severe or less severe than the conditions reported by the vendor.
- If a condition adverse to quality is identified, enter the issue into the corrective action program.
- Determine if a degraded/nonconforming condition exists for the station.

Degraded/Nonconforming Condition Exists:

- Licensee documents a technical determination that the MSIVs will remain operable until the planned replacement.
- Licensee plans to replace the limit switches at the next outage of sufficient duration.
- Licensee plans to revise the preventive maintenance frequency to reflect the new replacement interval.
- Licensee revises the UFSAR to include the new preventive maintenance frequency.

No Degraded/Nonconforming Condition Exists:

- Licensee uses the VTIP process to document a technical determination regarding the specific conditions over the installed life of the components and results of surveillance tests, review of equipment and component failures, and reviews of preventive maintenance and test results to validate that the environmental conditions that cause the premature degradation are less severe than the conditions reported by the vendor and will not cause the premature degradation of the phenolic material.

Case 2:

The plant has been operating for 45 years. During a routine review, a design engineer discovers that MSIV limit switches were not replaced at the end of their 40-year design life.

Initial Actions:

- Licensee enters the issue into the CAP.
- Licensee initiates an evaluation to determine whether the affected components

can remain in service beyond 45 years until they are replaced based on specific plant conditions.

- Determine if a degraded/nonconforming condition exists for the station.

Degraded/Nonconforming Condition Exists:

- Licensee documents a technical determination that the limit switches will remain operable until planned replacement during the next refueling outage based on review of industry operating experience for this limit switch, the specific conditions over the installed life of the components and results of surveillance tests, review of equipment and component failures, and reviews of preventive maintenance and test results to validate that the environmental conditions are less severe than the vendor data sheet for the limit switches.

- Licensee plans to replace the limit switches at the next outage of sufficient duration.

No Degraded/Nonconforming Condition Exists:

- Licensee documents a technical determination that the limit switches will remain operable until planned replacement at 50 years based on a based on review of industry operating experience for this limit switch, the specific conditions over the installed life of the components and results of surveillance tests, review of equipment and component failures, and reviews of preventive maintenance and test results to validate that the environmental conditions are less severe than the vendor data sheet for the limit switches.

- Licensee establishes a new replacement frequency based on the technical justification and revises the preventive maintenance frequency.

- Licensee revises the UFSAR to reflect the new design life of the limit switches.

Scenario 5

Background:

Component:

4 kV switchgear breakers used for safety related pump motors

Safety Classification:

Safety-related

Technical Specifications:

Technical Specification requirements are associated with ECCS pumps in Modes 1-4

Maintenance Rule Applicability:

In scope of the maintenance rule; current status is 10 CFR 50.65(a)(2)

Preventive Maintenance Program Guidance:

Plant procedures define a maintenance overhaul interval of 9 years. The manufacturer's recommended overhaul frequency is every 5 years or 10,000 operations, whichever occurs first. The EPRI PM Bases Database provides an overhaul frequency of 12 years.

Other Requirements:

None

Overview:

During a plant site engineering self-assessment, the self-assessment team identified a potential issue because the breaker vendor maintenance manual recommends an overhaul frequency of 5 years or 10,000 operations, whichever occurs first, but the preventive maintenance basis frequency is to perform an overhaul every 9 years with reference to the EPRI PM Bases frequency of 12 years. The vendor maintenance manual also states that the breakers are designed for 2500 operations before any replacement parts should be needed; the frequency of inspections should be determined by each operating company; extreme conditions of dust, moisture, corrosive gases can indicate inspections and maintenance will be required more frequently. The self-assessment team identifies the different overhaul frequencies in a corrective action document.

Case 1:

The licensee reviews the vendor documentation and finds that the breaker maintenance recommendations are based on use of the breakers in repetitive cycling applications, in non-conditioned environments associated with heavy industrial facilities. It is clear that the maintenance recommendations are applicable to applications with a high number of current interruptions. In contrast, some breakers used at the site may see only a few cycles each year. Additionally, all of the safety-related breakers on the site are in areas cooled by Class IE air conditioning systems. The licensee reviews trend information and finds that there have been no failures of a breaker to open or close for the last 20 years while the 9 year frequency was in effect. The licensee reviews the EPRI

PM Bases Database and finds that the site application is consistent with the PM Bases overhaul frequency of 12 years.

Initial Actions:

- The licensee documents the review of the vendor documentation and site application of the breakers in the self-assessment corrective action document.
- The licensee reviews the EPRI PM Bases Database and finds no information that would challenge the basis for a 9 year overhaul frequency.
- The licensee reviews surveillance test results and preventive maintenance inspections on the subject breakers and does not find abnormalities.

Licensee Planned Approach:

- None. No changes are required based on the application described in the vendor maintenance manual, the EPRI PM Bases Database, and review of site data on the breakers.